Glacial Lake Madawaska Archaeological Survey 1998

by
Pamela Dickinson and Jason Jeandron

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Cover
View of upper St. John River valley at Edmunston looking to the north east

Glacial Lake Madawaska Archaeological Survey Project: 1998

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1999

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ABSTRACT

During September of 1998, an archaeological survey by two archaeologists and eight field crew members examined several locations along the former shoreline of Glacial Lake Madawaska looking for evidence of Palæo-Indian people. Over 70 high potential areas were predetermined using geological maps, past Palæo-Indian research and current predictive models. These areas are elevated, well drained natural formations, on the shore of Glacial Lake Madawaska, ideal for habitation during the late Pleistocene and early Holocene. The probability of finding intact archaeological sites dating to the Palæo-Indian period was greatly reduced by the presence of a substantial number of modern quarries at the high potential areas identified. No settlements were found from the early post glacial period, but substantial evidence of later settlement was found. Three Late Archaic sites, two Pre-Contact sites of an unknown age and two historic sites were recorded during the survey. The five Pre-Contact sites were found within an area around First Lake in the Madawaska region. Due to time constraints only a small portion of the lake was visually surveyed. Of these seven identified sites, subsurface testing was performed at only one of the site locations. From these sites 15 Pre-Contact tools, 135 flakes and 54 historic artifacts were recovered.

SOMMAIRE

Au cours du mois de septembre 1998, une reconnaissance archéologique menée par deux archéologues et huit autres membres du personnel sur le terrain a scruté plusieurs emplacements le long de l'ancien rivage du lac glaciaire Madawaska, à la recherche de vestiges du peuple paléoindien. On a établi plus de 70 secteurs au potentiel élevé à l'aide de cartes géologiques, de recherches antérieures sur les Paléoindiens et de modèles de prévision actuels. Il s'agit de secteurs en altitude, de formations naturelles bien drainées le long du rivage du lac glaciaire Madawaska, une zone d'habitation idéale à la fin du pléistocène et au début de l'holocène. La probabilité de découvrir des sites archéologiques intacts demeurait cependant très faible, en raison de la présence d'un grand nombre de carrières modernes dans les secteurs à fort potentiel identifiés. Aucun vestige de villages datant des débuts de l'époque postglaciaire n'a été trouvé, mais des vestiges importants de villages plus récents ont été découverts. La mission de reconnaissance a permis de répertorier trois emplacements de la période archaïque supérieure, deux lieux historiques préeuropéens dont l'époque est inconnue et deux autres sites historiques. Les cinq sites préeuropéens ont été découverts dans un secteur à proximité du lac First dans la région de Madawaska. En raison de la contrainte de temps, seule une petite partie du lac a fait l'objet d'une prospection visuelle. Un seul des sept sites identifiés a fait l'objet d'une recherche en profondeur. Les sites ont permis de récupérer 15 outils préeuropéens, 135 éclats préhistoriques et 54 artefacts historiques.

ACKNOWLEDGMENTS

The 1998 Glacial Lake Madawaska Archaeological Project was a joint project sponsored by the Archaeological Services Branch of Department of Economic Development, Tourism and Culture, the Viscount Bennett Trust Fund as well as the Madawaska First Nation. Without the financial assistance from Archaeological Services and the Viscount Bennett Trust Fund and the personnel contribution and support of the Madawaska First Nation, the survey could not have taken place. Also, a special thank you must be given to the Maliseet Advisory Committee, the Chief and Council of the Madawaska First Nation, the city of Edmundston for supporting the project, as well as the crew members for persevering with the demanding testing strategy and suffering through the sometimes difficult working conditions during their introduction to archaeology.

A thank you must be given to the 40 private land holders who gave their permission to test on their land. Their co-operation and assistance was greatly appreciated.

There are many individuals who we must thank for helping throughout the research, methodological development, field preparation and/or analysis portion of the survey, these individuals gave of their time: Dr. David Black, Dr. Bruce Broster, Dr. David Keenlyside, Dr. Jim Petersen, Dr. Arthur Spiess, Cynthia Adams, Chris Blair, Brent Murphy and Al Seamen. A special thanks is extended to Dr. Chris Turnbull and Susan Blair for their professional advice and guidance throughout. Before field work could even begin many land holders had to be contacted. For those who helped with telephone calls, a thanks must be given to Dr. Gary Bruce, Melanie Caissie and Vincent Bourgeois, as their talents in the French language was greatly appreciated. A thank you is also given to Mandy Howlett who gave much of her time before, during and after the survey in office and technical support.

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INTRODUCTION

The Glacial Lake Madawaska Archaeological Survey was undertaken through the Archaeological Services Branch of the Department of Economic Development, Tourism and Culture, in conjunction with the Viscount Bennett Trust Fund and the Madawaska Maliseet First Nation. The goal of the project was to survey predetermined sections of the ancient Glacial Lake Madawaska strandline. The primary focus of the project was to locate, identify and record any evidence of Palæo-Indian activity along Glacial Lake Madawaska. Since the potential for Palæo-Indian sites in the area was high, it was determined that an archaeological survey should be conducted. For a period of four consecutive weeks, (August 31 to September 25, 1998), an archaeological field reconnaissance was conducted of high potential areas within the Madawaska region. The survey team was directed by Jason Jeandron and Pam Dickinson and crew members comprised of eight individuals chosen by the Madawaska First Nation.

The project objectives included:

1. locating and testing areas deemed high potential for Palæo-Indian activity.
2. a strict testing strategy using Standardised Test Pits (STP's), including a 50 X 50 cm size, screening all material excavated and placing all STP's five metres apart in a grid fashion.
3. working closely with the Madawaska First Nation community.
4. examining and finding out more information about the provenance of an artifact identified previously as a Late Palæo-Indian Plano point tip found within the region.

Physical Geography

Sites from throughout the Palæo-Indian period have been found throughout the U.S. and some Canadian provinces (Bonnichsen, Keenlyside and Turnmire 1991; Ellis and Deller 1988; Gramly and Funk 1990; Keenlyside 1991). Many of these sites have been found in association with the strandline of glacial lakes (Bonnichsen, Keenlyside and Turnmire 1991; Storck 1984). The strandline, or ecological edge, is found between the closed forest on the former mainland and vast areas of open habitats on the former lake bed undergoing revegetation. The Palæo-Indian people seem to have chosen distinct geological areas for habitation sites and kill sites. Site preference for the Palæo-Indian people tended to be along lakes, rivers, ponds or bog edges and in well drained, sandy soils (Storck 1984). These areas led to possible corridors for fish runs and big game animal movements which followed the orientation of the glacial shoreline (Julig 1984; Roberts

1984; Storck 1984). These elevated features offered the Palæo-Indian people an advantage in hunting strategies relating to the view and presence of the glacial lake. These areas were relatively dry, level and well drained expanses of sandy soil, ideal locations for habitation. Today these geological features are known as kames or kame terraces, beaches and drumlins. Some examples of Palæo-Indian sites found on these types of geological features are included in Figure 1.

Study Area

The Laurentide Ice Sheet remained within 100 km of the headwaters of the upper St. John River until nearly 10,000 B.P. (Kite and Stuckenrath 1989). A glacial lake formed in this area when the ice-front passed through north-western New Brunswick and a dam of ice drift developed across the old river channel at Grand Falls, New Brunswick (Lee 1955). A fast current of ice and water may have developed toward the margin of the ice sheet, where thinning ice may have followed depressions in the subglacial landscape developing an ice dam at Grand Falls. From this ice dam, a large glacial lake developed named Glacial Lake Madawaska. Lake Madawaska extended 130 km from Grand Falls, N.B. to beyond Lac Temiscouata, Quebec, and persisted until approximately 10,000 B.P., this may have been over 1,000 years after glacial ice dams disappeared from the upper St. John River basin (Kite and Stuckenrath 1989).

Kite and Stuckenrath (1989) suggest that Lake Madawaska met its demise approximately 10,000 B.P., based on radiocarbon dates obtained from the uppermost sediments of Lake Madawaska and from peat overlying these lacustrine sediments. Kite and Stuckenrath (1989) postulate that Lake Madawaska disbursed after isostatic adjustments changed the directional flow of water from flowing into the St. Lawrence River and allowed a south-eastward flow of the St. John River to erode the Grand Falls drift dam. Also suggested is the idea of the melting of buried glacial ice due to a climatic change. The "melting of ice cores within cross-valley drift dams, and changes in hydrology caused by climatic change" could have helped erode away the ice dam (Kite and Stuckenrath 1989: 125).

During the time of deglaciation there was a great change in vegetational development throughout the Northeast. Landscapes changed greatly at different times

Figure 1: Table of Palæo-Indian sites and environs

SITE	REGION	LOCATION
Vale	Maine	Elevated Glacial Outwash
Michaud	Maine	Outwash Delta
Munsungun	Maine	Kame Terrace
Debert	Nova Scotia	Elevated Glacial Outwash
Rimouski	Quebec	Elevated Marine Terrace

(Bonnichsen, Keenlyside and Turnmire 1991; Chapdelaine and Bourget 1992; Gramly 1982; MacDonald 1966, 1968; Spiess and Wilson 1987).

in different areas leading to the possibility of areas being inhabited. This is evident in radiocarbon dates from Palæo-Indian sites throughout the Northeast. The Vail Site in Maine produced six radiocarbon dates ranging from 10,300 to 11,120 B.P. Two radiocarbon dates place the Michaud Site in Maine as being occupied at 9,600 B.P. (Bonnichsen, Keenlyside, and Turnmire 1991). There was a total of 14 radiocarbon dates from the Debert Site in Nova Scotia, 13 of which average to 10,600 B.P. (MacDonald 1968:53). Bonnichsen, Jacobson, Davis and Borns (1985) discuss the idea that by 11,000 years ago almost all of the land surfaces in the Northeast were free of ice and were therefore open to colonisation. Again, radiocarbon dates taken from excavated Palæo-Indian sites from throughout the Northeast suggest that Palæo-Indian people could have inhabited the shores of Glacial Lake Madawaska before it met its demise around 10,000 B.P. Bonnichsen, Jacobson, Davis and Borns (1985) discuss a shift from tundra vegetation at 11,000 B.P. to a nearly continuous forest by 9,000 B.P. Again, the radiocarbon dates suggests that Palæo-Indian people would have occupied landscapes covered by tundra in some places, and by closed forest in others. Therefore, it is unreasonable to assume that all groups of Palæo-Indians lived in similar habitats (Bonnichsen, Jacobson, Davis and Borns 1985:158). This idea could explain the Palæo-Indian point tip being found approximately 21 km from the shores of Glacial Lake Madawaska at First Lake (Figure 2).

The study area consisted predominantly of Glacial Lake Madawaska and around First Lake, where the Plano tip was found. This artifact is evidence of a Late Palæo-Indian presence in the region. A review of twelve orthographic maps (1:10,000) were utilised to analyse the elevations of the thirteen areas tested. The study area was the New Brunswick portion of Glacial Lake Madawaska and falls between Grand Falls and Edmundston, New Brunswick (Rampton 1986; Rappol 1986). The strandline of Glacial Lake Madawaska is a geological feature which lies within the Madawaska region of northern New Brunswick. The bedrock in the areas tested consisted mostly of slate and slate outcrops. The study area is characterised by numerous glacially deposited kames, kame terraces, and other glacial features such as drumlins and beaches. An international boundary between the United States and Canada is present west of Glacial Lake Madawaska.

Figure 2: Plano point fragment from the study area at First Lake.

Methodology

The objective of this survey was to test areas along the Glacial Lake Madawaska strandline to find evidence of Palæo-Indian activity. In the event that any new sites were encountered they were to be identified through an analysis of the artifact, and accurately locate the site on a map. A strict testing strategy was imposed during the survey using STP's and screens. Also, a large portion of each high potential area was tested and screened to ensure a thorough investigation.

Areas to be tested were determined prior to arriving in the field. These areas were selected by using geological maps showing the glacial lake boundary and selected geological features suitable for Palæo-Indian habitation. Permission to access and conduct test excavations on the selected private properties was acquired prior to and during the field portion of the project.

Figure 3: Table of Glacial Lake Madawaska study areas, sampling frequencies, and geological contexts

Area Tested	Number of STP's	Feature Tested
Area 1 (A)(quarry)	35	kame
Area 1 (B)(quarry)	9	kame
Area 5 (quarry)	0	kame terrace
Area 10 (golf course)	0	kame terrace
Area 11 (quarry)	7	beach/bar
Area 12(tree farm)	58 (lower plateau)	kame terrace
Area 12 (tree farm)	48 (upper plateau)	kame terrace
Area 13 (quarry)	9	kame terrace
Area 14 (quarry)	52	beach/bar
Area 15 (logging)	0	kame terrace, beach/bar
Area 16 (quarry)	0	beach/bar
Area 21 (farm field)	51	kame terrace
Area 22 (field)	12	beach/bar
Area 24 (quarry)	13	kame terrace
Area 27 (field)	22	beach/bar
Total: 13	Total: 316	

The first task of the field work was a surface inspection of each study area to delineate the boundaries of the geological feature and determine if the feature was testable (see Figure 5). All areas were accessible by roads, and any permission needed to access these roads was granted prior to arriving at the area. Following this, a grid pattern was laid out covering the geological feature by placing flags at five metre intervals. Each STP was labelled using a northing and westing at five metre intervals (i.e. N100 W100, N105 W100). A Global Positioning System (Garmin 45) reading was recorded at each area from the STP labelled North 100 West 100. Each STP was completed with the flag in the north-west corner if possible. All subsurface testing was completed with shovel, trowel and bipedal screen (6 mm mesh). Each STP was a minimum of 50 X 50 cm. Straight walls and flat bottoms were maintained in each STP, if possible, to a depth which was consistent with the Palaeo shoreline. The STP's extended to a minimum of 10 cm below archaeological bottom.

A detailed surface inspection as well as STP's were conducted at nine of the thirteen areas tested (see Figure 3). At four of the thirteen areas only a visual inspection was completed along any erosional face. No subsurface testing was done at these four areas as the features had been removed by quarrying, construction or logging. Areas where the feature was only slightly to moderately impacted and the feature was still visible; the remainder of the study area was considered to have sufficient archaeological potential and was tested at five metre intervals. Of the 13 areas tested the glacial features consisted of kames, kame terraces, beaches and bars.

In most cases, an accurate grid was possible, but at times rough terrain or a large tree may have offset a STP. Following the excavation of the STP's, any area that may have an erosional face from a quarry or where ploughing may have occurred within the area, a visual inspection was completed. At the beginning, during and/or on completion of the STP's for each area, photographs were taken. Detailed notes were recorded at each area regarding general information, and a testhole record was filled out for each STP. Information on the testhole record for each STP included: the location of each STP within the grid system, any cultural material found, the maximum depth of the STP and which wall was profiled. Any comments pertaining to the STP was also recorded.

A report was given to a representative of the Madawaska First Nation as well as the Provincial Archaeologist at the end of each field week. Each day new archaeological finds were made the Madawaska First Nation was contacted and a representative was updated. At the end of the survey a presentation was given to the Maliseet Advisory Committee and Archaeological Services representatives. The final report was disseminated to Archaeological Services, the Madawaska First Nation Chief and Council, a representative of the Viscount Bennett Trust Fund, crew members and other archaeologists.

Resource Inventory

A significant amount of background research regarding the study area was completed prior to field work. Research included areas in Canada and the U.S. that had similar geological features and had evidence of Palæo-Indian activity (Davis and Jacobson 1985; Kite and

Stuckenrath 1989; Spiess and Wilson 1987; Storck 1984). A presentation was given to the Maliseet Advisory Committee at the Kingsclear First Nation, the Madawaska First Nation Chief and Council as well as to the Provincial Archaeologist, Chris Turnbull, before field work began. Orthographic maps, topographical maps, geological maps, as well as aerial photos taken from a low flying plane were obtained and studied.

A possible Plano point tip was found on the shore of First Lake, within the Madawaska region, about 21 kms from the glacial lake. This artifact signifies the definite presence of Palæo-Indian people in north-western New Brunswick. The Plano point had been kept by the collector and contact was made with her so a visual inspection could be made of the artifact and an exact location of the find spot could be determined. While doing a visual survey of the lake, five sites were recorded within approximately 500 metres of each other. Three of the sites recorded are relatively dated to the Archaic period by the types of diagnostic artifacts found.

History of Research

In June of 1973, Chris Turnbull, Provincial Archaeologist, surveyed part of the Green River within the Madawaska region. During this survey one Pre-Contact archaeological site was located (CiEb-1) at the mouth of Lunts Creek on the Green River. One flaked scraper was collected and charcoal was observed.

Aside from Turnbull's early work in the Upper St. John River valley, no other professional archaeologist has worked north of Grand Falls. Research was conducted by Sanger (1971) and Keenlyside (1993) on the Tobique River (south of Grand Falls) and Sanger also investigated the Upper St. John River valley in Maine, surveying for the Dickey-Lincoln Dam project (Nicholas 1986). These investigations produced sites that date to about 3,000 years ago.

Palæo-Indian Research

There have been numerous Palæo-Indian find spots throughout Maine and the Maritimes, some of these include:

New Brunswick: Quaco Head, Kingsclear, New Horton Creek, Tracadie River, Hebert and Hogan-Mullen.

Nova Scotia: Cape Blomidon, Gaspereau River and Amherst Shore.

Prince Edward Island: North Tryon, Basin Head, Savage Harbour and New London Bay.

Maine: Moosehorn, Graham Lake, Schoodic Lake, Skowhegan, Whitefield, Flagstaff Lake, Woolwich and Rumford. (Bonnichsen, Keenlyside and Turnmire 1991).

There are many isolated surface finds throughout Maine and the Maritimes and much fewer actual Palæo-Indian site locations, some of the site locations include:

Nova Scotia: Debert, Camp Debert, Belmont I, Belmont II.

Prince Edward Island: St. Peters Bay, Jones, Greenwich.

Quebec: Rimouski.

Maine: Munsungun/Chase Lake, Benton Falls (possible site), Asiscohos Lake Adkins, Morss, Vail, Lower Wheeler Dam, Upper Wheeler Dam, Wright, North Wayne, Auburn, Lamoreau, Michaud, Lebanon (Bonnichsen, Keenlyside and Turnmire 1991).

Ongoing and completed research relating to Palæo-Indian sites located in Maine and the Maritimes has helped to postulate settlement and subsistence

models for Palæo-Indian people (Bonnichsen, Jacobson, Davis and Borns 1985; Bonnichsen, Keenlyside and Turnmire 1991; Storck 1984, 1993). However, due to acidic soil conditions and the low number of sites located, there is little concrete evidence of the organic material culture of the Palæo-Indian people. It has been determined that Palæo-Indian people in this region exhibited considerable diversity, ranging from small and large habitation sites, probable kill sites and quarry sites (Bonnichsen, Keenlyside and Turnmire 1991; Ellis and Deller 1997; Tankersley, Vanderlann, Holland and Bland 1997). Palaeoenvironmental data as well as site locations suggest that the Palæo-Indian people lived in an ice marginal environment while glacial ice was still in the region (Cwynar, Levesque, Mayle and Walker 1994; Davis and Jacobson, Jr. 1985; Hughes 1987; Jones 1994; Joyce 1988; Kite and Stuckenrath 1989). By 10,600 years ago only relic ice caps remained over northern Maine and the highlands of central Nova Scotia.

There seems to have been a preference for specific types of lithic material for tool making and evidence of travelling great distances for that specific lithic type (Ellis and Lothrop 1989; Julig 1984; Storck 1993). An early Palæo-Indian point, found at Kingsclear First Nation (40 km north of Fredericton), is made of chert that outcrops on Munsungan Lake, Maine. The route travelled would likely have been along the Aroostook River into the St. John River around Perth-Andover, NB. The St. John River valley has almost certainly been a primary focus for both travel and subsistence resources since deglaciation and the arrival of the Palaeoindians. Glacial Lake Madawaska was connected by rivers to a known Palæo-Indian quarry site at Munsungun Lake, Maine.

THE FINDINGS

Site Descriptions

The Tree Farm Site (CiEc-1) is a historic site which was discovered while surveying a kame terrace for evidence of Palæo-Indian people. There were few artifacts and no historic features were found within the tested area (see Figure 4).

The Soucy Site (CiEb-2) is a historical site discovered after personal communication with a land owner (see Figure 7). We were told that there were remains of a 1785 Acadian homestead on his property. A visual survey was completed of the area and many historical artifacts were discovered within a ploughed field in the area. Numerous foundation stones and one corner stone was discovered over a nearby embankment. Also discovered in the ploughed field was a ground slate fragment with a bevelled edge, similar to other ground slate found at the Jemseg site (BhDm-14) which is thought to date to the Middle Archaic period (pers. comm. S. Blair 1998) (see Figure 9).

In 1996, an individual using First Lake for summer canoeing and recreation found the tip portion of a projectile point on the beach. The projectile point was viewed shortly after by an archaeologist at Archaeological Services and determined to be a Late Palæo-Indian Plano point tip. Upon completion of analysis, the artifact was returned to the individual who found it. The area where the Plano point tip was discovered was visually surveyed during the Glacial Lake Madawaska Archaeological Survey and five Pre-Contact sites were discovered in the area. These sites do not, however, date to the Palæo-Indian Period. Three of the five sites date to the Late Archaic Period; no diagnostic artifacts were found at the other two sites. Also, identified in the water approximately one metre from Calling Loon site (CjEb-1)(see Figure 6), at First Lake, were two possible hearth rings.

A meeting was set up at First Lake with one of the individuals who found the Plano point tip and its provenance was determined. Another meeting was also set up so the point could be viewed and discussed, and subsequently returned to Archaeological Services.

Historic Sites:

Tree Farm CiEc-1

106 standardised test pits completed.

Artifact Assemblage: 5 specimens collected.

Specimen Collected	**No.**
historic ceramic frag.	3
metal wardens badge	1
red glass fragment	1
Total specimens	5

Figure 4: Photograph of the Tree Farm Site (CiEc-1)

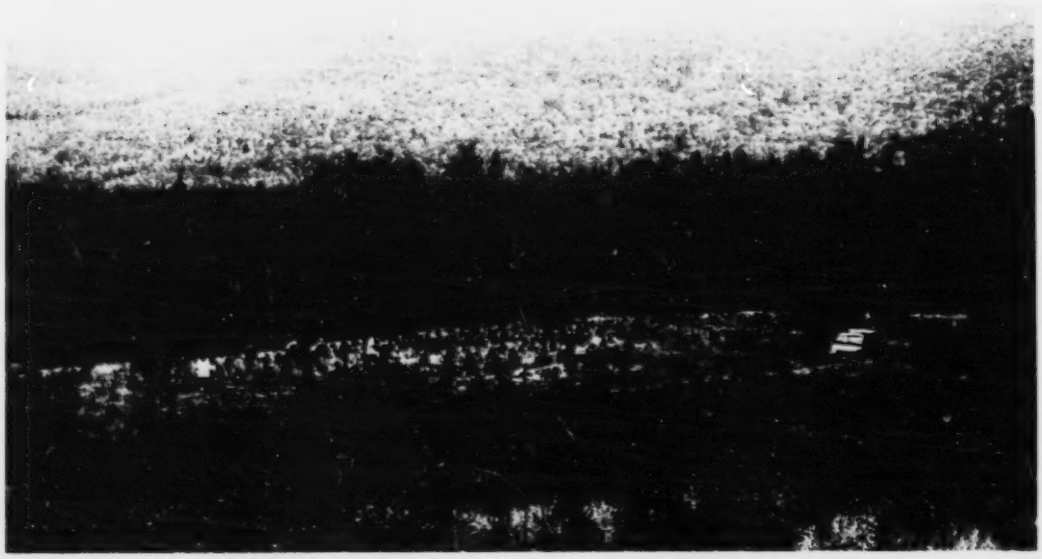
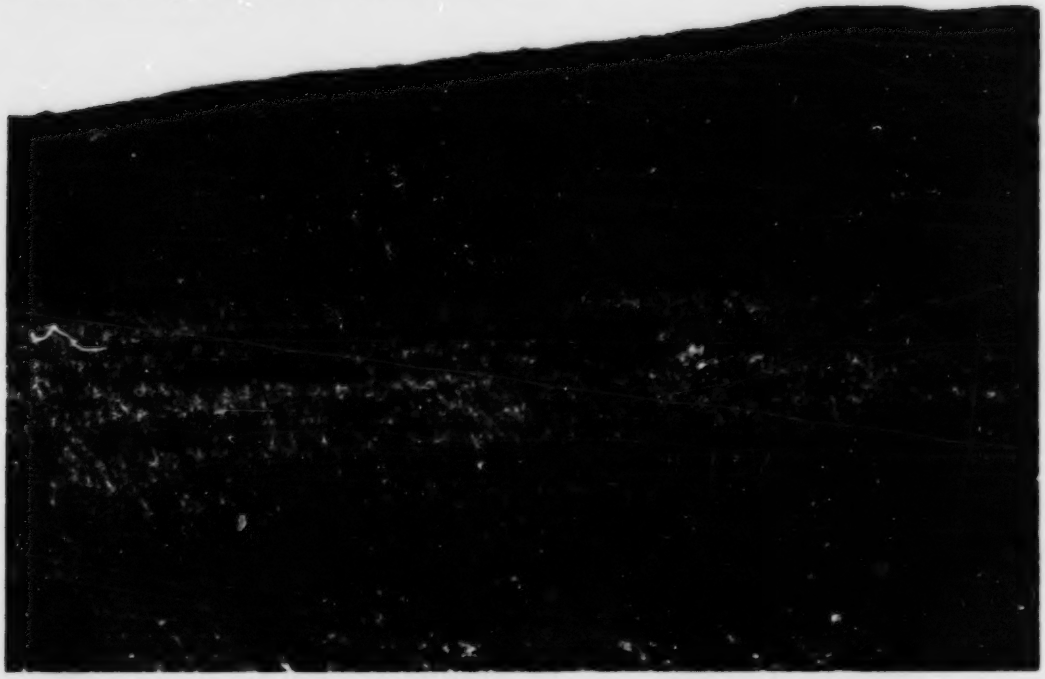


Figure 5: Testing in Progress at Area 27

Figure 6: View of First Lake and Calling Loon Site (CjEb-1)

Figure 7: Photograph of the Soucy Site (CiEb-2)



Soucy CiEb-2
Surface collection only.
Artifact Assemblage: 49 specimens collected.

Specimen Collected	**No.**
glass fragment	15
historic ceramic frag.	33
ground slate frag. with bevelled edge (Pre-Contact)	1
Total specimens	49

Pre-Contact Sites:
Calling Loon CjEb-1
Surface collection only.
Artifact Assemblage: 100 specimens collected.

Specimens Collected	**No.**
biface fragment	2
knife tip	1
flakes	94
spokeshave	1
utilised flake	1
ground / pecked adze	1
Total specimens	100

Cobble Beach CjEb-2
Surface collection only.
Artifact Assemblage: 1 specimen collected.

Specimen Collected	**No.**
biface preform	1
Total specimen	1

First Lake CjEb-3
Surface collection only.
Artifact Assemblage: 3 specimens collected.

Specimens Collected	**No.**
flaked axe	1
adze	1
maul	1
Total specimens	3

Driftwood CjEb-4
Surface collection only.
Artifact Assemblage: 42 specimens collected.

Specimens Collected	**No.**
flakes	39
retouched flakes	2
ground and pecked axe	1
Total specimens	42

Hebert CjEb-5
Surface collection only.
Artifact Assemblage: 4 specimens collected.

Specimens Collected	**No.**
ground and pecked axe	1
flakes	2
European pipe bowl	1
Total specimens	4

Pre-Contact Artifacts
Ground Stone Tools:
Adze CjEb-3:2 Fig. 12 right
Pecked adze with some weathering. Minor grinding on the dorsal surface with fine grinding at the bit.

length	220.0 mm
width	56.8 mm
bit width	53.3 mm
thickness	40.1 mm
weight	610 grams

Flaked Axe CjEb-3:1 Fig. 12 left
Flaked axe, which is very heavily bleached and weathered.

length	273.0 mm
width	90.1 mm
thickness	21.5 mm
weight	758 grams

Figure 8: Artifacts from Calling Loon Site (CjEb-1)

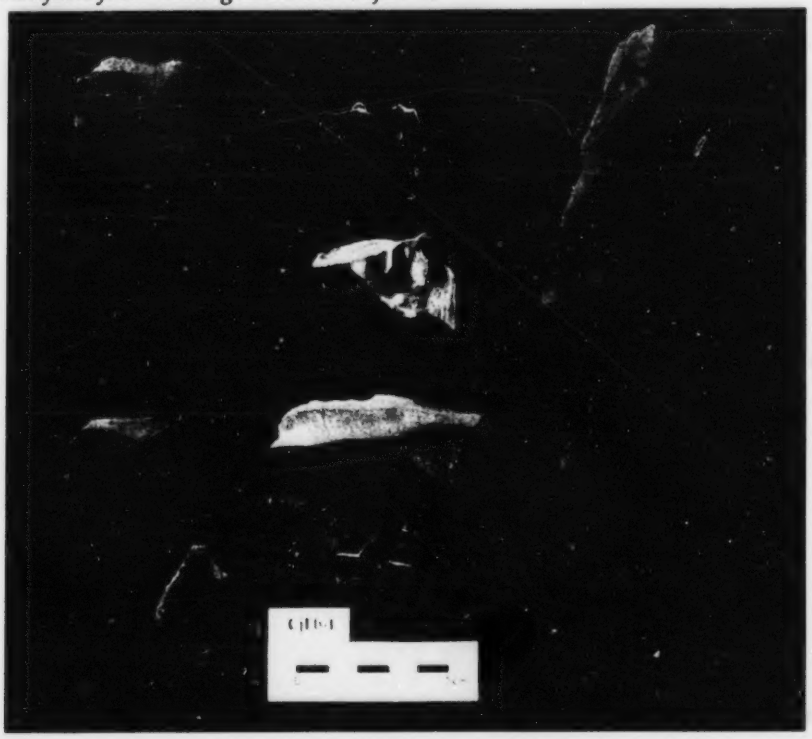
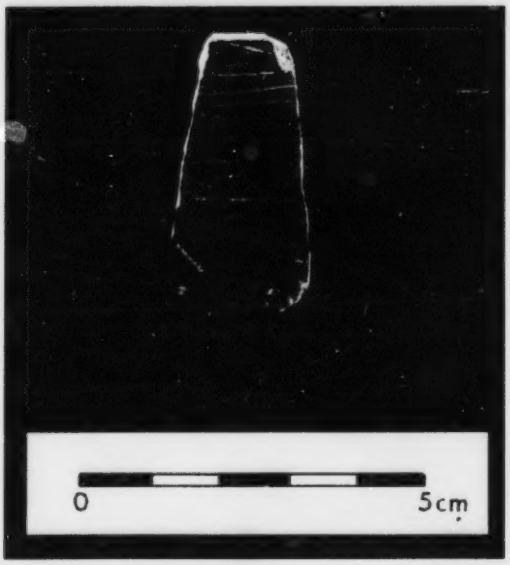


Figure 9: Ground slate artifact from the Soucy Site (CiEb-2)



Ground-Pecked Axe CjEb-4:42 Fig. 14

Ground and pecked axe with a flake removed from both sides of the bit end. Bit end appears to be resharpened by grinding.

length	170.0 mm
width	104.8 mm
bit width	72.2 mm
groove width	25.5 mm
thickness	48.9 mm
weight	956 grams

Ground and Pecked Axe CjEb-5:1 Fig.13

Ground and pecked axe which has a flake removed from the pole end. The bit end is broken.

length (broken)	190 mm
width	103.0 mm
bit width (broken)	
groove width	36.5 mm
thickness	36.4 mm
weight	1020 grams

Adze CjEb-1:100 Fig. 10

The adze is extremely weathered with the outer cortex flaking and falling apart.

length	185.0 mm
width (bit)	63.5 mm
thickness	31.4 mm
weight	430 grams

Maul CjEb-3:3 Fig. 12 centre

The pecked groove follows around the entire equator of the maul. Both ends of the maul have possible scarring or pecking from banging or use.

length	128.2 mm
width	93.0 mm
groove width	20.4 mm
thickness	70.8 mm
weight	1112 grams

Flaked Stone Tools:

Biface Preform CjEb-2:1 Fig. 11

Crude biface with evidence of some pressure flaking around the entire outer edge.

length	69.2 mm
width	35.5 mm
thickness	12.1 mm
weight	34 grams

Biface Base CjEb-1:1 Fig. 8 top left

The biface base appears to be the same lithic material macroscopically as found at Round Mountain, Munsungan Lake. There is a hinge fracture at the broken end.

length (broken)	84.7 mm
width	45.6 mm
thickness	10.1 mm
weight	54 grams

Biface Tip CjEb-1:3 Fig. 8 top left

The biface tip appears to be the same lithic material macroscopically as found at Round Mountain, Munsungan Lake. There is a hinge fracture at the broken end.

length (broken)	81.6 mm
width	67.0 mm
thickness	15.8 mm
weight	86 grams

Biface Mid-Section CjEb-1:2 Fig. 8 bottom left

The biface mid-section appears to be the same lithic material macroscopically as found at Round Mountain, Munsungan Lake. The mid-section has a hinge fracture at both ends.

length (broken)	83.3 mm
width	66.4 mm
thickness	13.4 mm
weight	104 grams

Spokeshave CjEb-1:98 Fig. 8 top middle

The spokeshave appears to be the same lithic material macroscopically as found at the Willard Brook quarry, Munsungan Lake, Maine. The spokeshave is worn along the working edge.

length	37.6 mm
width	17.0 mm
thickness	6.3 mm
weight	4 grams
working edge	12.0 mm

depth of the working edge 3.4 mm

Flakes:

95 Flakes CjEb-1

Of the 95 flakes, 89 appear to be macroscopically similar to hand samples from Willard Brook and Round Mountain quarries on Munsungan Lake. The other 6 flakes are unidentifiable.

40 Flakes CjEb-4

Of the 40 flakes, some appear to be from the Munsungan Lake quarries while the majority are unidentifiable visually.

2 Flakes CjEb-5 Fig. 13

Both flakes are unidentifiable macroscopically.

Ground Slate

Ground Slate Frag. CiEb-2:1 Fig. 9

The ground slate fragment has a bevelled edge on one end. There are grinding striations parallel to the bevelled edge with a smaller amount perpendicular.

length (broken)	41.8 mm
width (broken)	20.2 mm
width bevelled edge (broken)	2.0 mm
thickness	1.8 mm

Figure 10: Adze blade from Calling Loon Site (CjEb-1)

Figure 11: Preform from Cobble Beach Site (CjEb-2)

Historic Period Artifacts

Clay Pipe Bowl CjEb-5:4 Fig. 13

There is a manufacturing seam down the outside of the pipe bowl. The pipe is probably early 19th century.

diameter of inside bowl	19.7 mm
max. outer diameter	27.2 mm
thickness of bowl wall	3.3 mm

15 Glass Fragments CiEb-2:2-16

There are dark green, light green, light blue and brown glass fragments. All the glass is probably bottle glass. There is one bottle neck top of dark green glass. The mouth piece has been applied separately to the bottle neck.

31 Ceramic Frags. CiEb-2:17-47

The historic ceramic fragments are mostly all 20th century white ware. Three of the ceramic fragments are possibly early 19th century blue scalloped edge fragments. There is one small fragment which is a bottom foot rim with white glaze which has a light blue tinting around the foot ring.

2 Ceramic Frags. CiEb-2:48-49

There is one large red sewage drainage tile fragment and one large fragment of earthenware from a yellow glazed jug.

Figure 12: Artifacts from First Lake Site (CjEb-3)

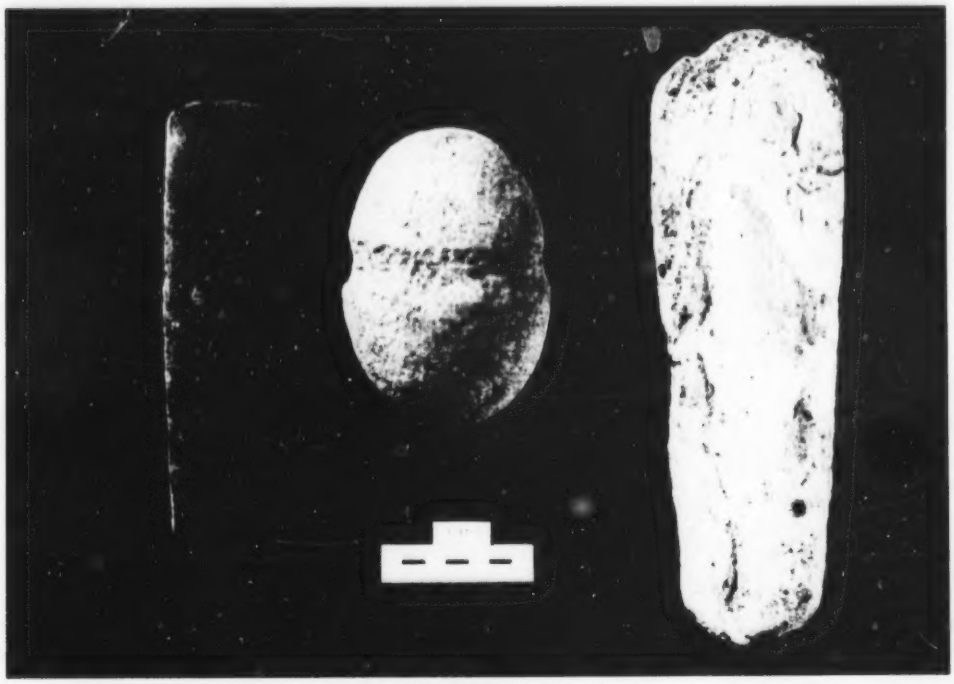


Figure 13: Artifacts from Hebert Site (CjEb-5)

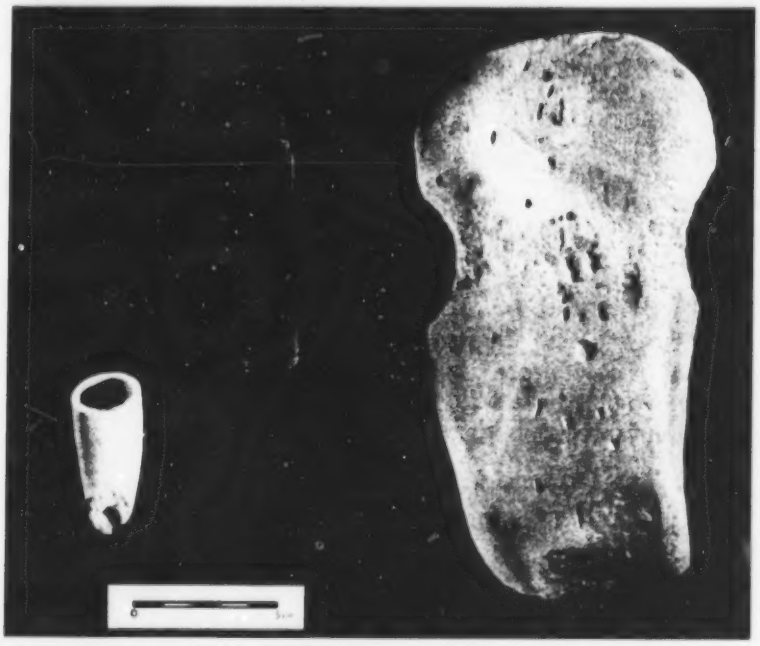


Figure 14: Axe from Driftwood Site (CjEb-4)

1 Glass Fragment CiEc-1:5
Glass foot from a red dish.

3 Ceramic Frags. CiEc-1:1-3
Three fragments of white porcelain. One ceramic fragment is a rim top, one is broken on all sides and one is a fragment of a bottom foot rim.

Metal Warden's Badge CiEc-1:4
Metal warden's badge. "Fish Game Protective Assn. Ex-Officio Game Warden 1947 New Brunswick (9902)".

Figure 15: A 1947 metal warden's badge from CiEc-1

THE RESULTS

Artifact Analysis

The following analysis, albeit brief, discusses the artifacts recovered from the sites on First Lake (CjEb-1-5) and the possible cultural affiliations to which they may belong. It should be noted that all of the artifacts from First Lake were surface collected in a controlled manner, along a very small portion of the lake.

The artifacts (grooved axes, flaked axe, adze, maul) strongly suggest a heavy woodworking industry, likely of the Archaic period. With that in mind, the following is a brief summary of the various Archaic cultures in the Maine/Maritimes region and the people who may be responsible for the artifacts left behind.

Laurentian , Vergennes(4500-5500 B.P.)

Ritchie(1980) describes the Laurentian tradition as an "extensive Archaic cultural continuum, widely spread throughout north-eastern North America"(pp.79). In the last two decades, research in the Maine/Maritimes region has increased and so has the information surrounding the people of the Laurentian tradition. Ritchie's concept was revised by Tuck (Bourque 1995:3) and defined as being confined mostly to the Great Lakes drainage basin where hardwoods prevail and fishing was the major means for gathering food. The tool kit of the Laurentian tradition includes the gouge, adze, plummet, ground slate points and knives, ulu, atlatl weights, and flaked stone projectile points (Ritchie 1980:79-83). The Laurentian tradition appears in this region most notably as Vergennes style artifacts.

In 1991, Cox reported a site (95.20) on the Saint Croix River in Maine. In this article, Cox discusses the areas where these sites tend to occur: "Known Vergennes sites can be found on tributary streams and rivers or at the headwaters of major drainages rather than on the main channels... Most commonly, Vergennes sites occur at lake outlets or by rapids in a river or stream" (Cox 1991:156). The environment of this tradition includes the mixed conifer and hardwoods of the Lake Forest region, which again, includes the Maine/Maritimes region. The Laurentian and Vergennes traditions seemingly represent interior based groups of people who are not coastally adapted and tend to focus resource acquisition to lakes and rivers (cf Dincauze 1974).

Artifacts typical of the Vergennes tradition are Otter Creek points, scrapers (some "humpback"), crude biface choppers, ground slate ulus, ground slate knives and abraders, ground stone points, plummets, celts, gouges, atlatl weights, drills and ground stone rods (Cox 1991, Tuck 1991).

Due to its geographic locale and the minimal diagnostic artifact assemblage

available, the most likely culture represented at First Lake appears to be Vergennes. The grooved axes recovered on this survey are very similar to those found at the level 5A/B interface from the Neville site in New Hampshire (Dincauze 1976) which date earlier to the Middle Archaic, however, those dates may not be reliable. Also, the large cobble with the heavy pecking around its equator (maul), is suggestive of an early Late Archaic manifestation (Petersen, Robinson, Belknap, Stark, and Kaplan 1994).

Susquehanna (3000-4000 B. P.)

Perhaps one of the least understood Late Archaic phases of the Northeast is the Susquehanna. The Susquehanna appear in the archaeological record in the Maritimes around 4,000 years ago and exist to about 3,000 years ago and are credited with introducing pottery to the Northeast (Ritchie 1980). Of the late Late Archaic traditions, the Susquehanna are the most oriented towards freshwater subsistence. The artifacts most notably associated with this group are pecked axes, broadpoints and steatite bowls (Jeandron 1996). Of particular interest to this discussion are the pecked axes that are distinctive of this phase. These axes are similar to those found during this survey but different in the following ways. Susquehanna axes often have ridges on the edges of the pecked grooves and are usually finely made. The axes from First Lake are roughly finished and are void of ridges near the pecked grooves.

All of the diagnostic artifacts found around First Lake are suggestive of the Vergennes phase. The location of the sites—on a lake, at a great distance from a major water source—and the heavy woodworking

Figure 16: Testing in Progress at Area 1

tools are all strong indicators of the Vergennes phase. However, there are a lot of grey areas that need further explanation and more investigation.

Overview of Survey Results

None of the artifacts found are directly related to the Palæo-Indian people for which this project was designed. There are no known archaeological resources relating to the Palæo-Indian people present in the areas tested, other than the surface-collected possible Plano point. This conclusion has been made, with confidence, due to the absence of any archaeological materials in the: extensive number of standardised test pits dug at each of the 13 areas surveyed (316), the often several hundred metres of cut bank inspected at quarried areas (7 of the 13 areas) and in the extensive area impacted by industry within many of the study areas (golf course, tree farm, ploughed field and logging).

Of the areas surveyed only two were undisturbed. The strict methodological strategy imposed at each study area seems to have been suitable and sufficient to confirm the absence of archaeological features or artifacts.

The finding of a historic site along the St. John River which was outside the Glacial Lake Madawaska strandline, as well as five Pre-Contact sites discovered around First Lake, indicates that local informant interviews and surveys beyond the boundaries of the study area helped to inform archaeologists of the culture history of the Madawaska region.

The survey included the testing of *only* thirteen of the possible seventy or more high potential areas found around Glacial Lake Madawaska. The areas tested are well away from the current shoreline of the Madawaska River and opportunities for finding sites outside of the Historic or Palæo-Indian Periods are slim. The region must still contain a wealth of potential for Maritime Archaic and Maritime Woodland Period sites as evidenced by the collection from First Lake.

Evaluation of Objectives

As no artifacts relating to Palæo-Indian activity were found within the excavated areas and surface surveys completed, it has been determined that no archaeological resources belonging to the Palæo-Indian people are present in those areas. These results indicate that no further archaeological work is required within the project areas *tested*.

Following the objective of using standardised test pits, screening and intensifying the survey by placing all STP's five metres apart in a grid fashion, this facilitated the conclusion that there is no evidence of Palæo-Indian habitation in these tested areas. However, the potential for evidence of Palæo-Indian and later sites is still very high but more ground needs to be covered. To date, the only recorded sites found north of Grand Falls in New Brunswick are those listed in this publication which illustrates the need for further evaluation of the region.

Working closely with the Madawaska First Nation community added an integral part to the survey. The field crew were all picked by the Madawaska First Nation and were interested in learning how to best preserve their heritage, and how best to gain the most information about their past through archaeology. The crew members brought to the project a cultural perspective with respect for the past and respect for the artifacts.

Archaeological Services had been shown

a biface tip found within the Madawaska region at First Lake, however, no actual provenance had been acquired. The biface tip was deemed to be a Late Palæo-Indian Plano point and was returned to the individual who found it after an analysis was complete. A meeting was set up at First Lake during the survey and more accurate information regarding the provenance of the point tip was obtained. Another meeting was set up to see the artifact and discuss in greater detail if other artifacts were ever discovered in the area by the individual. During this meeting the individual asked if the Plano point tip could be kept at Archaeological Services until a proper storage facility could be achieved by the Madawaska First Nation community. The Plano point tip is now being housed at Archaeological Services in Fredericton.

Summary

Of the thirteen predetermined high potential areas for Palæo-Indian sites that were tested only two were undisturbed and many were mostly to completely gone. It is impossible to determine today what has been lost to construction and development. We can say, without a doubt however, that without archaeological testing prior to these landforms being disturbed it is possible that the archaeological evidence of Pre-Contact people who visited or lived in those areas may be lost forever (see Figure 16).

Of the thirteen areas that were tested using STP's only one site was found (CiEc-1). This method of testing appears to be the best way (both time and cost effective) to approach the surveying of areas with Palæo-Indian potential. Due to time constraints, however, only a very small portion of the Glacial Lake Madawaska strandline was tested. In all of the areas tested, the subsurface strandline was identified with success.

Two historic sites were located. One of these sites, the Tree Farm site (CiEc-1), was at an area that subsurface testing was completed. There were no features found and the only artifact found that dates the site is a 1947 Fish and Game Protective Association Warden medal (9902)(Figure 15). The other historical site, the Soucy site (CiEb-2), was visited on the advice of one of the land owners. The individual communicated that it was the site of a 1785 Acadian house. A walking survey was completed of the area, which included a ploughed field. Many historical artifacts were distributed throughout the ploughed field and remnants of the foundation, including a corner stone was located over a nearby bank. Three of the historical ceramic fragments collected from the site may date to the early 1800's (pers. comm. Chris Blair 1998). Also found in the same area was a fragment of ground slate with a bevelled edge that may be from the Middle Archaic period (pers. comm. Susan Blair 1998).

There were five Pre-Contact sites identified through a walking survey, no subsurface testing was completed within this area. The sites were all within an approximately 500 metre area of beach around First Lake. Since very little time was spent surveying this lake, the number of sites found within such a small area suggests that this lake was a very attractive area during Pre-Contact times. From the quantity of sites located around First Lake it is suspected that if survey work continues around the lake, as well as adjoining lakes and rivers, they will probably yield more archaeological finds and sites. Over 150 lithic artifacts were collected from these five Pre-Contact sites even though the area is moderately im-

pacted by people (7 complete and finished tools, 1 biface preform, fragments from a large knife, 3 utilised/retouched flakes and debitage).

Based on the information gathered from the research and fieldwork portion of the project there is reason to suspect other Pre-Contact sites in the Glacial Lake Madawaska region, specifically areas related to where the five Pre-Contact sites were found. It is thought that the lake was part of a travel route which would connect the St. John River to the Saint Lawrence River. Due to time constraints and limited funding, the First Lake area as well as a large majority of the strandline of Glacial Lake Madawaska could not be completely surveyed or tested.

Potential Impact to Identified Sites

The lake is being used by individuals for camping, canoeing, fishing and hunting. One archaeological site is currently being used as a boat launch and is heavily disturbed by past and present human activity. Also impacting on the archaeological resources on the lake is the raising and lowering of the water levels by the opening and closing of a dam located at the south-east end of First Lake at the Lake Branch River. Further examination and testing of the lake may reveal intact features and diagnostic artifacts that would allow us to determine more accurately the function and age of the site.

Potential Impact to Study Area

As discussed above, the majority of areas tested for potential Palæo-Indian sites were disturbed by active quarries. City development and logging also impacted on the areas tested. Only two of the thirteen study areas were undisturbed by human activity.

Potential Benefits

This study has contributed greatly to the knowledge of the heritage resources in the Madawaska region. This project introduced archaeology to the community of Madawaska and brings to light the long Pre-Contact and historic occupation within the area.

A good working relationship developed between the Madawaska First Nation and Archaeological Services while working together to discover the prehistory of the Madawaska region.

Protection of the identified sites that are being impacted and disturbed by present human activity, at First Lake, was a concern. An alliance developed between the Edmundston City Council, the Madawaska First Nation, the Department of Fisheries and Oceans and Archaeological Services to help preserve and protect these discovered Pre-Contact sites, as well as other sites that may be around the lake by adjusting the dam and raising the water levels.

Recommendations

Upon the conclusion of the 1998 Glacial Lake Madawaska Archaeological Survey, there are five principal recommendations:

1. It is necessary that a thorough survey of the entire length of the glacial lake be continued. For the remaining high potential areas along the glacial lake to be surveyed there is at least two full summer field seasons (over 55 high potential areas remaining) of survey work within the designated area. This survey work should continue in co-operation with the Madawaska First Nation.

2. Due to the high traffic area around the archaeological sites at First Lake, it can be expected to have an adverse effect on the heritage resources of the area. In view of the lakes present situation and the research contribution that the sites will make to the prehistory of the area, it is strongly recommended that the water level in the lake be raised to cover the sites as soon as possible and be kept high.
3. Also, due to the high number of campers and canoe travel at First Lake these sites are particularly vulnerable to individuals who collect artifacts or those who do not know the importance of leaving artifacts where they lay. It is recommended that sites around the lake area be excavated at the earliest opportunity.
4. It is recommended also that an archaeological resource inventory be carried out for the complete Madawaska region.
5. Surveys and testing are necessary to identify areas used historically or prehistorically, prior to impact or development. It is recommended that legislation be adopted that would make it a requirement that any potential area which is going to be impacted upon be tested by an archaeologist for any heritage resources. It became clear in this survey that many high potential areas are being destroyed without knowing what information about the culture history of the area may be lost.

By following the recommendations suggested above, both researchers and the general public can benefit. Archaeologists, the First Nation community and the general public can gain more information regarding the prehistory and lifeways within the Madawaska region. It is a possibility that displays or site interpretation centres could be set up to help give people access to some of the history in the northern part of our province.

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